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The Development of an Integrated Treatment for Veterans with Comorbid Chronic Pain and Posttraumatic Stress Disorder

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ABSTRACT

Objective. The purpose of this article is to describe the development of the first integrated treatment for Veterans with comorbid chronic pain and posttraumatic stress disorder (PTSD).

Design. Descriptive, including pre- and posttreatment assessment results from a pilot study of six veterans with comorbid chronic pain and PTSD.

Setting. Northeastern Department of Veterans Affairs Medical Center.

Interventions. Using components of cognitive processing therapy (CPT) for PTSD and cognitive behavioral therapy (CBT) for chronic pain management, a 12-session integrated treatment for veterans with comorbid chronic pain and PTSD was developed. A therapist manual and patient workbook that included weekly readings and homework assignments were created. Participants received pre- and posttreatment evaluations using measures of pain, PTSD, physical disability, and psychological distress. The treatment development process is reviewed and the benefits and challenges of implementing this integrated treatment are presented.

Results. Several themes emerged over the course of implementing the treatment, including the importance of establishing participant trust, regular therapy attendance, and addressing participant avoidance. Of the six participants recruited for the pilot study, three withdrew from the study and three completed the integrated treatment. Participants reported that they generally liked the format of treatment, appreciated learning about the ways that chronic pain and PTSD share some common symptoms, and ways that the two disorders can interact with one another. The assessment results of those who completed treatment suggest that this treatment approach is feasible and may have clinical benefit.

Conclusions. Participants appeared to benefit from receiving the integrated treatment for pain and PTSD. A randomized clinical trial is currently being conducted to evaluate the efficacy of this treatment approach.

Key Words. Pain; Iraq; Veterans; Military Personnel; Posttraumatic Stress Disorder; Wounds and Injuries

Introduction

The wars in Iraq and Afghanistan have resulted in a growing number of soldiers being evacuated to the United States for comprehensive care related to both physical and psychological trauma. Common physical injuries include traumatic brain injury or postconcussive syndrome, fractures, amputations, burns, spinal cord injury, eye injury, and auditory trauma. Given the number and magnitude of the physical injuries that are often experienced by soldiers, it is not surprising

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that chronic pain is a common problem among returning soldiers, with the most common pain sites being the head, legs, and shoulders [1–3]. In addition, it is clear that Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) soldiers are reporting high rates of mental health issues including posttraumatic stress disorder (PTSD), depression, and alcohol use disorders [4,5]. Research suggests that the physical and psychological health issues reported by OEF/OIF veterans rarely appear in isolation but rather in combination with one another [6]. The complex profile of injuries often observed supports the use of a biopsychosocial assessment and treatment approach to the provision of health care. In order to maximize clinical success, providers across disciplines need to work together to develop treatments that are complementary, based on theory, and supported by empirical evidence.

The co-occurrence of chronic pain and PTSD may have serious negative implications for the adaptive functioning. Research suggests that patients with chronic pain and PTSD experience more intense pain and affective distress, higher levels of life interference, and greater disability than patients with either pain or PTSD alone [7–9]. Given the prevalence of chronic pain and PTSD among veterans, and the negative impact these two conditions can have on quality of life, it is important that treatments are developed to target these conditions in an effective manner.

This article will describe the development of the first integrated treatment for chronic pain and PTSD. First, we will review information on the symptoms, prevalence, and existing evidence-based treatments for both chronic pain and PTSD. Second, we will highlight the frequent comorbidity of the two conditions and the rationale for developing an integrated treatment. Third, we will describe the process of developing the integrated treatment and descriptive data from several case studies will be presented. The benefits and challenges of implementing this integrated treatment are presented in the discussion, along with potential directions for future research.

Chronic Pain: Symptoms, Prevalence, and Treatment

Pain that persists for longer than 3 months and that initially accompanies a disease process or bodily injury that may have resolved or healed is considered chronic pain [10]. Consistent with a biopsychosocial model of illness, individuals with chronic pain often report that pain interferes with their ability to engage in occupational, social or recreational activities. This inability to engage in everyday activities may contribute to negative mood (e.g., feelings of worthlessness, depression, or anxiety), increased isolation, and physical deconditioning, all of which can exacerbate or contribute to the experience of pain. Current estimates are that the budgetary costs of providing disability compensation benefits and medical care to the veterans from Iraq and Afghanistan over the course of their lives will be from $350–$700 billion, depending on the length of deployment of U.S. soldiers, the speed with which they claim disability benefits, and the growth rate of benefits and health care inflation [11]. Studies have found that nearly 50% of veterans report that they experience pain on a regular basis [12]. Given the scope of this problem, efforts to provide accurate assessment and effective treatment for patients with chronic pain are a priority in the VA health care system.

One psychological treatment approach for the management of chronic pain is called cognitive–behavioral therapy (CBT). CBT is a skills-based treatment approach that focuses on teaching patients ways to identify and change maladaptive thoughts, feelings, and behaviors, and to replace them with those that are more balanced and adaptive, with the ultimate goal of improving patients' overall quality of life and reducing psychological distress. In addition, cognitive–behavioral treatment approaches focus on changing certain target behaviors that appear to be problematic, and teach adaptive ways of coping. Cognitive–behavioral approaches have been shown to be highly effective in treating a range of disorders, from PTSD and other mood disorders to pain disorders in adults and in children [13–15]. CBT for pain is aimed at changing maladaptive thoughts and behaviors that serve to maintain and exacerbate the experience of pain. The cognitive-behavioral approach is informed by the understanding that people generally do not stop being active because of pain, but because they have become adjusted to the idea that they are physically "disabled." Thus, CBT for chronic pain involves challenging those beliefs and teaching patients ways of safely reintroducing enjoyable activities into their lives. This can be a particularly daunting task when thoughts related to disability have been in place for many years. There are several key components to CBT for chronic pain, including cognitive restructuring (i.e., teaching patients how to recognize and

change maladaptive thoughts), relaxation training (e.g., diaphragmatic breathing, progressive muscle relaxation), time-based activity pacing (i.e., teaching patients how to become more active without overdoing it), and graded homework assignments designed to decrease patients' avoidance of activity and reintroduce a healthy, more active lifestyle. As individuals who experience chronic pain often report reduced activity levels and declines in social functioning, CBT also focuses on promoting patients' increased activity and productive functioning using techniques such as exercise homework, activity scheduling, and graded task assignments [16].

A substantial literature exists documenting the efficacy of CBT for a variety of chronic pain conditions. CBT produces reductions in pain in patients with osteoarthritis [17], chronic back and neck pain [18], and tension headache [19]. In a meta-analysis of 22 randomized controlled trials of psychological treatments for chronic low back pain, cognitive–behavioral and self-regulatory treatments, specifically, were found to be efficacious [14].

PTSD: Symptoms, Prevalence, and Treatment

PTSD can occur following exposure to an event that is, or is perceived to be threatening to the well being of oneself or another person. The distinctive profile of symptoms in PTSD include: 1) exposure to a traumatic event that involves the threat of death or serious injury; 2) re-experiencing the event in the form of intrusive thoughts, nightmares, flashbacks to the traumatic event, and psychophysiological reactivity to cues of the traumatic event; 3) avoidance of thoughts, people, and places that resemble the traumatic event, emotional numbing, and an absence of emotional attachments; and 4) symptoms of hyperarousal, including heightened startle sensitivity, sleep problems, attentional difficulties, hypervigilance, and the presence of irritability and anger [20]. The estimated lifetime prevalence rate for PTSD in the general population is 6.8% with women being more than twice as likely as men to have PTSD at some point during their lives [21]. Individuals who are engaged in military combat are at significant risk for exposure to traumatic events and the subsequent development of PTSD. For example, a recent study found that in a sample of 103,788 OEF/OIF veterans seen at VA facilities, 13% were diagnosed with PTSD [5].

Some studies suggest that prolonged exposure (PE), which involves repeated imaginary exposure to the traumatic memory and repeated in vivo exposure to safe situations that were previously avoided, is one of the most efficient and efficacious treatment techniques [22]. Additional studies have found that Cognitive Processing Therapy (CPT), which is a more cognitively based treatment, can also be highly effective in the treatment of PTSD. There are a number of trials that provide the evidence base for CPT across trauma populations, including survivors of sexual abuse [23], incarcerated adolescents with PTSD [24], and refugees [25]. CPT has also been adapted for use with Veterans suffering combat-related PTSD and research supports the efficacy with this population [26]. Cognitive restructuring is a critical part of CPT and therapists work with clients on challenging false beliefs around themes of safety, trust, power and control, esteem, and intimacy. In general, CPT produces large, clinically significant treatment effects not only in PTSD symptoms, but also for comorbid conditions such as depression, general anxiety, somatic problems, dissociation, and self-injurious behaviors [27].

Prevalence of Comorbid Pain and PTSD

A number of studies have been published that have examined the prevalence of comorbid pain and PTSD. Studies of veteran and non-veteran patients reporting for the treatment of pain have indicated that between 34% to 50% of patients have PTSD or significant PTSD symptomatology [28,9]. However, studies of patients reporting for treatment of PTSD have found that between 45% to 80% report the presence of a chronic pain condition [29,30].

The rates of chronic pain and PTSD in OEF/OIF Veterans receiving treatment in the VA health care system are high. When assessing veterans receiving care at Level 2 Polytrauma Network Sites in the VA (sites for specialized outpatient and sub-acute rehabilitation), one study found that in a sample of 62 patients, 97% complained of pain and 71% met criteria for PTSD [3]. Another study found that in a sample of 340 OEF/OIF Veterans, chronic pain and PTSD were present in 81.5% and 68.2%, respectively [6]. In a study of 50 OEF/OIF injured service members treated at a Level 1 Polytrauma Rehabilitation Center (site responsible for addressing the health care needs of more seriously injured veterans), 96% reported a pain problem and 78% reported experiencing mental

health problems, with the most common problem being PTSD (44%) [1]. Taken together, these studies demonstrate the high co-prevalence rates of these conditions, particularly in soldiers injured in the wars in Iraq and Afghanistan.

Theoretical Models Underlying Comorbid Pain and PTSD

The high rate of co-morbidity and symptom overlap between chronic pain and PTSD suggest that the two disorders may have a common link. For some individuals, the temporal link is clear, as in the case where the pain and PTSD are the result of a common traumatic event, such as combat-related injury. In such a case, the experience of pain or PTSD may serve as a reminder of the other condition [31]. For example, one patient reported: "The pain made me think of the day I was shot and I just stood there in the store, unable to move." However, for many people, the onset of pain and PTSD are not related to a single event, and yet the experience of one can impact the other.

Otis, Keane, and Kerns [32] proposed a Triple Vulnerability Model [33] to explain the development of chronic pain and PTSD. According to the model, there may be biological, psychological, and a specialized psychological vulnerability that contribute to the development of both conditions. There is support for genetic/biological risk factors in the development of anxiety disorders such as PTSD, as well as for chronic pain [34,35]. Pain may have a biological basis, but just as a biological vulnerability is a risk factor in the development of anxiety, yet is not sufficient to cause an anxiety disorder, the presence of structural pathology alone is often not sufficient to account for the presence of a chronic pain condition. Other psychological vulnerabilities must also be present to develop chronic pain or PTSD. One factor that has been proposed as a psychological vulnerability is "anxiety sensitivity" (AS), which refers to the fear of arousal-related sensations arising from beliefs that these sensations have harmful consequences [36]. It is believed that a person with high levels of AS is likely to become fearful in response to physical sensations such as heart pounding, breathlessness, or pain, thinking that these symptoms may signal that something is wrong. When people with high AS encounter a traumatic event or pain, they are believed to respond with more fear and avoidance than those with low AS. Thus, the tendency to respond with fear to physical sensations is seen as a shared vulnerability contributing to the development of either disorder.

Another psychological vulnerability is lack of control, which is common to both disorders. For example, when a person is exposed to a traumatic event, in order to develop PTSD, one must develop anxiety or the sense that the events, including one's own emotional reaction to them, are proceeding in an unpredictable and uncontrollable manner. When a negative affect and a sense of uncontrollability develop, PTSD may emerge. When applied to pain, studies have shown that patients with chronic often exhibit poor coping skills, have poor social support, and perceive a lack of control [37]. More specifically, it is possible that for some people to develop a chronic pain, they must also believe that the pain is proceeding in an unpredictable and uncontrollable manner. When combined with failed past attempts to cope with pain, this could contribute to decreased self-efficacy and low expectations of adaptively coping with future experiences of pain, which may constitute a specific psychological vulnerability to developing chronic pain.

Rationale for Developing an Integrated Treatment for Pain and PTSD

The rationale for the development of an integrated treatment for chronic pain and PTSD was based on research on the treatment of dual disorders, knowledge of the evidence-based treatments for both conditions, as well as many anecdotal clinical examples of patients for whom separate treatments for each disorder did not work well [38]. Clinical experiences and observations of veterans who have both chronic pain and PTSD suggested that veterans with both conditions were less likely to engage in treatment for either condition. For example, it was observed that while some veterans were receiving psychological treatment for their PTSD, they reported that the experience of pain was contributing to their PTSD symptoms. It was often reported that the pain was serving as a reminder of the traumatic event, particularly when the pain and the trauma were related. For example, one Vietnam era veteran reported: "Whenever I'm lying in bed at night and my shoulder starts hurting, I start having memories of when we were caught in the ambush." Conversely, while some veterans were receiving psychological treatment for chronic pain, they reported that the experience of PTSD was contributing to their pain and making partici-

pation in pain management difficult or impossible. One OEF/OIF veteran reported, "When I think about the day our Humvee was hit by the IED I can feel the pain in my back flare up right where I was hurt." Providers often reported feeling frustrated when these patients did not comply with treatment recommendations. Providers also reported that they felt they lacked the training necessary to address both of these related conditions. As a result, these patients would often not receive adequate pain or PTSD treatment because they were being referred back and forth between pain and PTSD treatment clinics. In addition, the poor coordination of care was further contributing to the veterans' distrust of the VA health care system and their providers.

It was hypothesized that if a treatment could be created that addressed PTSD and the chronic pain in a thoughtful and effective manner, then treating both conditions simultaneously might result in a better outcome. Traditionally, treatment for dual disorders has been provided in a sequential or parallel format. In sequential treatment, a patient is not eligible for treatment of a problem in one system until the other problem is resolved or stabilized. For example, a patient with chronic pain and PTSD would not be eligible for pain treatment until their PTSD was addressed. There are several problems with sequential treatment including: 1) the untreated disorder can worsen the treated disorder; 2) disagreement as to which disorder should be treated first; and 3) clinicians often do not follow through with referrals for the untreated disorder. In parallel treatment, different providers treat the disorders simultaneously. Problems with this approach include: 1) poor active collaboration among providers; 2) different philosophies of treatment; and 3) patients often receive no treatment due to a failure of either treatment provider to accept final responsibility for the patient. Further, research has documented poor prognosis for patients with dual disorders treated with traditional sequential and parallel approaches, and has suggested higher rates of health service utilization [39]. In contrast, an integrated treatment approach for dual disorders can overcome many of the limitations of the traditional approaches. As a result, many different integrated treatment programs have been developed to meet the needs of patients with dual disorders [38]. This prompted the consideration of the development of an integrated treatment approach for chronic pain and PTSD.

The Development of an Integrated Treatment

One of our primary goals was to create an integrated treatment for chronic pain and PTSD that amounted to more than simply the sum of parts from each individual treatment. Each of the components of treatment should work with one another in a sequence that adds incremental value to the treatment. A second goal was to create a treatment that was effective and transportable so that it would be considered clinically practical to use by therapists outside of the confines of a research study. This meant that the treatment had to be easily understood by therapist and patient, and not overly time intensive.

The integrated treatment was developed through a multi-step process. The first step entailed extensive meetings with co-investigators who had expertise in either pain management, PTSD, or both to determine treatment objectives and the approach to be taken. The second step entailed fleshing out the protocol and making decisions about the sequence of treatment components, session content, and the essential elements that would be included in the integrated treatment. Based on a review of the literature, and in consultation with study co-investigators, it was decided that elements from CBT for pain management and CPT for PTSD would be combined for the integrated treatment. Elements of CPT were included in the integrated treatment because of their emphasis on challenging cognitive errors. The third step involved pilot testing the newly formed integrated treatment with veterans with PTSD and chronic pain. Results of this pilot testing were used to inform the treatment; treatment was subsequently tailored based on qualitative feedback from participants. The fourth step involved designing a randomized controlled trial to test the efficacy of the integrated treatment as compared to pain treatment alone, PTSD treatment alone, or a waitlist condition. Each of these treatment development steps will now be described in turn.

Steps 1 and 2: Meetings with Collaborators to Decide on Protocol

During the treatment development phase, time was spent in meetings with co-investigators discussing the key elements in each of the treatment approaches that needed to be included in the integrated treatment and places where the two treatments tended to overlap in their presentation of material. The triple vulnerability model served as

a guide for determining some of the essential elements of treatment. For example, as it was hypothesized that AS may play a role in the development of chronic pain and PTSD, it was decided that one of the treatment sessions would be devoted to "interoceptive exposure" exercises. Interoceptive exposure exercises, such as spinning in a chair, running in place, and breathing through a narrow straw, provide an opportunity for the patient to experience physiological sensations that are common in anxiety and PTSD reactions such as shortness of breath, dizziness, and racing heart. As it was theorized that a heightened sensitivity to these sensations could be contributing to catastrophic thinking and avoidance of thoughts, situations, or activities that had the potential to bring on the sensations, it was decided that exposure in session would be an effective way for the patient to experience the sensations, watch them dissipate, and thus gain a sense of mastery over them. Interoceptive exercises that produced physiological sensations that were highly relevant to the patient were practiced repeatedly in session and assigned as homework.

Avoidance is considered a key factor in the perpetuation of pain (e.g., the avoidance of activities that have the potential to cause pain) and the experience of PTSD (the avoidance of reminders of the trauma), thus treatment elements aimed at reducing avoidance were considered essential for the integrated treatment. In order to reduce avoidance related to pain, behavioral goals that typically involved engagement in reinforcing and pleasant activities were an integral part of treatment. For example, the first session of treatment began with the patient and the therapist working together to establish at least three overall goals that would be worked towards over the course of therapy. The goals needed to be behavioral and quantifiable so that goal completion could be assessed. In addition, goals needed to be reasonably achievable during treatment. Avoidance related to PTSD was addressed in two ways. First, in the first session, each participant was asked to write a one-page "Impact Statement" on what it meant to them that they had chronic pain or had experienced the traumatic event. Second, participants were asked to give a brief verbal account of the traumatic event. Behavioral goal completion and homework completion related to the content of the preceding therapy session were assessed at the beginning of each therapy session using a "Weekly Goal Completion" form that contained the specific goals assigned and a 0 to 10 scale with 0 meaning "not at all accomplished" and 10 meaning "completely accomplished." The participant and the therapist completed this form together.

Another element that was emphasized was helping patients to identify thoughts and beliefs that were not adaptive and that were only serving to contribute to pain or PTSD. In order to accomplish this, the integrated treatment contained a strong cognitive component that began with teaching patients about the relationship between how they think and feel, how to identify maladaptive thoughts, and how to change negative and unwanted emotions by learning to recognize the maladaptive thoughts that give rise to them; a process called "cognitive restructuring." Throughout treatment, patients were taught to identify places where their thoughts had become "stuck." Catastrophic and negative ways of thinking related to the experience of chronic pain (e.g., I can't cope with my pain) were specifically addressed and challenged. Borrowing treatment elements from CPT, the integrated treatment addressed the ways in which the experience of trauma or pain had impacted the patient's beliefs about safety, trust, powerful others, self-esteem and intimacy.

When developing the integrated treatment, we carefully considered the sequence in which the cognitive and behavioral treatment approaches would be delivered across sessions. It was decided that given the importance of increasing patient activity and addressing negative and catastrophic thinking, these activities should begin early in the treatment and be carried out throughout the course of the program. It was decided that a 12-session individual treatment that was delivered once a week for 60 minutes would allow for the delivery of the essential elements of treatment while not being too time intensive and impractical (See Table 1). Once a draft of the treatment manual had been developed the study entered a pilot testing phase in which six participants were recruited.

Step 3: Pilot Testing

The present study was approved by local VA Research and Development Committee and the Institutional Review Board prior to initiation and all participants gave informed consent to participate. Participants were recruited by the placement of advertisements in patient care areas in a Northeastern Department of the Veterans Affairs Medical Center. Patients were eligible for participation if they had chronic pain, defined as constant

Table 1 Outline of the integrated treatment for pain and PTSD

Session	Session Topic
Session 1	Education on chronic pain and PTSD & goal setting
Session 2	Making meaning of pain and PTSD
Session 3	Thoughts/feelings related to pain and PTSD & cognitive errors
Session 4	Cognitive restructuring
Session 5	Diaphragmatic breathing and progressive muscle relaxation
Session 6	Avoidance and interoceptive exposure
Session 7	Pacing and pleasant activities
Session 8	Sleep hygiene
Session 9	Safety/trust (related to pain and PTSD)
Session 10	Power/control/anger (related to pain and PTSD)
Session 11	Esteem/intimacy (related to pain and PTSD)
Session 12	Relapse prevention and flare-up planning

pain of at least 6 months duration [9], with a neurologic or musculoskeletal etiology, and PTSD based on DSM-IV diagnostic criteria [20]. Stability of pain and anxiety medications was required for two months prior to study entry and during treatment. Patients with life-threatening or acute physical illness, current psychosis or suicidal ideation, and individuals seeking pain treatment such as surgical interventions were excluded.

It was initially decided to exclude veterans from participating with a history of substance abuse or dependence; however, while performing preliminary phone screens of veterans interested in participating in the study, it became apparent that many of them had problematic use of alcohol or other drugs in the past year. It was decided that the initial plan to exclude all of these veterans from participating was too restrictive and would significantly limit the population from which we could sample. Therefore, study inclusion criteria were modified to allow inclusion of veterans who had a history of alcohol or drug dependence but who had not had problematic use in the last 6 months. It was hoped that this would allow us to offer this study to veterans who were in the most need of help during a window of time in which they would have a highest likelihood of learning the skills offered.

The integrated treatment was delivered by two Ph.D. level clinical psychologists who had previous training in CBT, and who had specific training and experience in the application of CBT to chronic pain management and CPT for PTSD. Treatment was conducted in VA mental health office space. While the treatment was being administered, the study PI and therapists met weekly to discuss participant progress, to refine the content of each treatment session, and to brainstorm examples that would resonate specifically with veterans in order to enhance treatment delivery. Meetings also focused on refining the patient learning materials and homework assignments that accompanied each session.

Description of Pilot Participants

A total of six participants were recruited to assess the feasibility and potential efficacy of the integrated treatment for chronic pain PTSD. Two of the participants dropped out of treatment before the third session; one participant dropped out due to a family emergency and the second participant refused to continue treatment because he did not want to complete homework assignments that required him to think about his trauma. A third participant discontinued treatment due a family health problem. Thus, we will present data on three of the six participants who completed all 12 sessions of the treatment protocol.

Participant 1 was a 59–year-old Caucasian male veteran with chronic pain and PTSD related to falling out of a helicopter while in Vietnam. He was also significantly depressed with a history of alcohol abuse, currently in remission. At pretreatment, he did not participate in social activities due to his depression and pain, and avoided many situations that triggered thoughts related to his trauma. Participant 2 was a 51-year-old African-American female veteran with chronic pain and PTSD due to military sexual trauma. She reported having musculoskeletal pain located in her back, neck, and shoulders. At pretreatment, she reported having difficulties with managing her anger, she was physically inactive, and she was reporting experiencing chronic pain that was interfering in many aspects of her life. Participant 3 was a 58–year-old Caucasian male veteran with neck, shoulder, and back pain. His trauma was related to events witnessed while in Vietnam. At pretreatment, he reported having marital difficulties, discomfort being around children, and difficulty trusting people in authority.

Measures

In order to assess changes, measures of each of the key domains of the chronic pain experience (i.e., pain, distress, and disability), and PTSD symptoms were administered pre- and posttreatment. Each measure had substantial evidence supporting its reliability and validity, as well as evidence of sensitivity to treatment effects. Assessments were

conducted by an independent evaluator with specialized training and supervision related to the administration of the assessment measures and structured clinical interviews. Participants were reimbursed for their completion of pre- and post-treatment assessments.

PTSD

Clinician-Administered PTSD Scale (CAPS [40]). This 30-item structured interview is designed to assess both the 17 symptoms of PTSD and the 8 hypothesized associated features. The scale yields a dichotomous diagnosis of PTSD, and also provides a continuous score of frequency and severity for each symptom. In addition, a behaviorally anchored probe question is provided for each symptom to increase the reliability of administration. Scores of 50 or greater may be used to reach a diagnosis for PTSD.

PTSD Checklist—Specific Version (PCL-S [41]): The PCL is a 17-item self-report questionnaire designed to assess PTSD symptomatology. Participants are presented with a list of symptoms of PTSD and asked to indicate the extent to which they have been bothered by each of the symptoms during the past month using a 5-point Likert-type scale. Scores of 50 are suggestive of PTSD.

Pain, Distress and Disability

McGill Pain Questionnaire (MPQ [42]): is a self-report questionnaire consisting of 102 words separated into three major classes; the sensory, affective, and evaluative aspects of pain. Respondents are asked to circle the word that best describes their pain. Scores range from 0 to 78 with higher scores indicating more pain.

Beck Depression Inventory (BDI [43]): is a 21-item self-report measure of depressive symptom severity that is used to assess the extent to which an individual currently exhibits or experiences each of the behaviors, thoughts, or affective features of depression. The BDI yields a total score for depressive symptom severity as well as two subscales including cognitive and somatic symptoms of depression.

Roland & Morris Disability Questionnaire [44]: is a 24-item self-report questionnaire that measures self-rated disability due to pain. A dichotomous response format is used, with "yes" indicating that a patient has difficulty with that particular activity, and "no" meaning that they do not have difficulty. The total score may range from 0 (no disability) to 24 (severe disability).

Descriptive Case Study Results

Qualitative Feedback Obtained from the Pilot Participants

In order to refine the integrated treatment, therapists were asked to take detailed notes after each treatment session on patient acceptability of the session content. This information was then processed with the research team at weekly meetings. On several occasions, therapists were observed delivering the integrated treatment using a two-way mirror and immediate feedback was provided to the therapist by the observer. In addition, audio tapes were made of every therapy session and reviewed by the team. As a result of this process, several themes emerged that helped us to refine the treatment and the manner in which it was delivered.

1. Establishing Trust

One issue that became clear was that veterans with chronic pain and PTSD often reported difficulty trusting others. It was reported by several participants that people in authority could not be trusted. Common reasons for these thoughts included their belief that a person with authority had allowed the trauma to occur, or had given orders that resulted in the traumatic event. As a result, trust in people, particularly individuals associated with the government, was shattered. This distrust frequently extended to the VA healthcare system and the therapists involved in this study. In fact, one patient stated at the first session: "I don't trust you, and I'm only going to let you into my head a little," and "I don't trust the government because of what they might do. I hate them for what they did, and still do." Failed attempts by health care providers to manage their pain also contributed to these beliefs. In order to address the patients distrust, a greater emphasis was placed on addressing these thoughts and therapists were taught to deliver the message that trust does not have to be "all or nothing" but instead should be viewed as existing on a continuum, and varying depending on the situation.

2. Attendance and Length of Treatment

While therapy attendance was typically good at the beginning of treatment, therapists noted a high frequency of missed sessions and gaps in attendance, and patients who would "disappear" for weeks at a time but eventually resurface. The research team felt that this was significant because many of the skills taught build on one another and work best when a certain degree of "therapeutic

momentum" is in place. In order to increase the likelihood of attendance, therapists made reminder calls to patients the day before the session and would schedule sessions on days where the patient had scheduled other appointments. Another issue that was expressed by several participants was that the treatment seemed to take too many sessions to complete. They expressed desire for a briefer form of treatment.

3. Addressing Avoidance

It was observed that when veterans were faced with difficult homework assignments that required that they think about their trauma or challenge their way of thinking, they were less likely to attend the following session. In these instances, avoidance of the therapy session was used as a way to escape having to face the emotional demands of the situation. For example, at the beginning of the second therapy session one participant sat down in his chair and stated in a loud voice as he pounded his fist on my desk: "There will BE no more homework!" The patient reported that the homework assignment was causing him distress and that he was not ready to deal with his emotions. Although time was spent for most of that session discussing the difficulties he was having, and discussing the benefits of not avoiding, this was the last session the participant attended. However, strategies that helped to overcome avoidance by other participants included directly addressing the avoidance, discussing the "pros and cons" of avoidance as a coping strategy, and breaking down goals into smaller more manageable steps.

4. Homework Completion

Perhaps related to avoidance, some participants often came to session without having completed any of their homework goals. As a result, more emphasis was placed on setting up treatment goals in a collaborative manner with the patient so as to increase goal internalization and motivation for goal achievement. Another challenge faced was patients reporting that they had lost their homework (e.g., left it on the bus, spilled something in it, let it at home, etc.). In order to address this issue, a spiral-bound patient workbook was created that contained a summary of the information delivered in each treatment session and containing all of the assigned readings and homework sheets needed for the 12-week integrated treatment. The workbook received positive feedback from participants who reported that it kept them organized and allowed them to have easy access to the treatment materials.

Quantitative Information Obtained from Pilot Participants

Upon completion of the 12-week integrated treatment, participants 1 and 2 no longer met diagnostic criteria for PTSD based on their responses on the CAPS and the PCL-S (see Table 2).

Both participants also experienced reductions in symptoms of chronic pain based on their completion of the MPQ. Scores on the BDI slightly increased for participant 1, but decreased for participant 2. Scores on the Roland Morris Disability Scale decreased for participants 1 and 2. Thus, except for their responses on the BDI, which were mixed, both participants appeared to benefit from receiving the integrated treatment for chronic pain and PTSD. At pretreatment, both participants had longstanding pain and significant avoidance due to pain and PTSD, while at posttreatment, both participants reported reductions in pain and no longer met diagnostic criteria for PTSD.

Participant 3 had a somewhat different pattern of results. Although he reported satisfaction with the skills learned in treatment and his responses suggested that he was more active following the completion of the integrated treatment, at posttreatment, he continued to meet criteria for PTSD, his MPQ scores remained relatively unchanged, and his responses on the BDI indicated that he was feeling even more depressed. There are a number of factors that might have contributed to this participant's poor response to treatment. A review of the therapist notes indicated that in addition to chronic pain and PTSD the participant was also diagnosed with bipolar disorder and often struggled with managing his emotions. Contributing to this problem was the fact that throughout the course of therapy, he had been experiencing marital problems that were causing him a great deal of emotional distress and resulting in missed appointments, gaps in

Table 2 Pretreatment and posttreatment assessment results for pilot participants

	Participant 1		Participant 2		Participant 3	
	Pre	Post	Pre	Post	Pre	Post
CAPS	83	35	91	55	91	79
PCL-S	73	36	64	48	60	54
MPQ	15	1	41	16	41	40
BDI	30	34	28	21	24	33
Roland Morris	15	10	8	4	20	11

CAPS & PCL-S clinical cutoff = 50; BDI range of scores = 0 to 9 = minimal, 10 to 16 = mild, 17 to 29 moderate, 30 to 63 = severe.

treatment, and incomplete homework completion. While other participants also reported experiencing hardships over the course of treatment, this participant's lack of response to treatment could be related to the fact that he received less of a "dose" of the essential elements of treatment.

Discussion

Chronic pain and PTSD are highly prevalent problems among U.S. veterans that can have a significant negative impact on quality of life. This article describes the development and pilot testing of an integrated treatment for veterans with comorbid chronic pain and PTSD. Using a multistep approach that included meetings with collaborators to decide on key elements of treatment, developing the treatment manuals, and tailoring the manuals based on feedback from study therapists and participants, an integrated treatment for chronic pain and PTSD was created. Overall, participants who completed the integrated treatment program responded well to therapy and reported that they generally liked the format of treatment, appreciated learning about the ways that chronic pain and PTSD share some common symptoms, and ways that the two disorders can interact with one another. Given the physical and psychological problems often faced by injured soldiers, if future well-controlled research studies find that the positive effects observed in participants receiving the integrated treatment are greater than the effects observed in participants who receive evidence-based treatments for either chronic pain or PTSD, then this line of research could have direct benefits for the improved care of our veterans.

These descriptive pilot findings support the feasibility of this approach to treatment; however, as this was a descriptive pilot study and there was no comparison group, these results should be interpreted with caution. Following completion of the pilot study, a randomized controlled trial (RCT) was initiated to investigate the efficacy of the integrated treatment when compared to evidence-based treatments for chronic pain and PTSD. The RCT, which was funded by the VA Rehabilitation Research and Development Service, is a ($2 \times 2 \times 3$) mixed factorial design (CBT for PAIN, CPT for PTSD, Integrated Treatment, and Waitlist Control Condition) by three-evaluation period (pretreatment, posttreatment, and 6-month follow-up) repeated measures design with multiple dependent measures.

If the results of the RCT indicate that the integrated treatment for chronic pain and PTSD is effective, future research might investigate if there are ways to make the treatment more easily accessible, such as a computerized or web-based format or making some sessions telephone-based. One interesting factor we will be investigating is if there is any difference in response to treatment depending on the timing of the onset of pain and PTSD (e.g., Vietnam era veterans vs OEF/OIF veterans). For example, OEF/OIF veterans with pain and PTSD are generally younger, which means that there is an increased likelihood that the pain and PTSD will be associated with the same event. Additionally, as they are younger, they will have had less time to cognitively process the meaning of these conditions.

Regardless of the combat theater in which a veteran has been engaged, it is imperative that researchers develop more integrated assessment and treatment techniques for chronic pain and PTSD. As well-controlled studies are launched, and treatment strategies are tested with patients of all ages with co-morbid chronic pain and PTSD, we may then begin to refine our existing treatment protocols. This can only be done through systematic and well-controlled research.

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